

$$(8.42) E(x, y) = h \sum_i x_i - \beta \sum_{\{i, j\}} x_i x_j - \eta \sum_i x_i y_i$$

これを

$$E(x_k=1, x_{\{i+k\}}, y) = h + \sum_{i+k} x_i - \beta \sum_j x_j - \beta \sum_{\{i, j\}} x_i x_j - \eta y_k - \eta \sum_{i+k} x_i y_i$$

$\uparrow$  隣接対の和  
 $\downarrow$   $x_k$  の隣接対  
 $\downarrow$   $x_k$  の隣接対  
 $\downarrow$   $x_k$  の隣接対

$$E(x_k=-1, x_{\{i+k\}}, y) = -h + \sum_{i+k} x_i + \beta \sum_j x_j - \beta \sum_{\{i, j\}} x_i x_j + \eta y_k - \eta \sum_{i+k} x_i y_i$$

$\downarrow$   $x_k$  の隣接対  
 $\downarrow$   $x_k$  の隣接対

よって

$$E(x_k=1, x_{\{i+k\}}, y) - E(x_k=-1, x_{\{i+k\}}, y) = 2(h - \beta \sum_j x_j - \eta y_k)$$

を得る。